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MARYLAND ENTOMOLOGICAL SOCIETY

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The purpose of the Maryland Entomological Society, which was formed in November, 1971, is to promote the science of entomology in all its branches, to provide a meeting place for professional and amatuer entomologists residing in Maryland and the District of Columbia, to issue a periodical and other publications dealing with entomology and to facilitate the exchange of ideas and information through its meetings and publications.

Membership in the Society is open to all persons interested in the study of entomology. All members receive the journal, Maryland Entomologist, and monthly newsletters, Phaeton. Institutions may subscribe to the Maryland Entomologist but may not become members. Prospective members should send to the Treasurer full dues for the current year, together with their full name, address, telephone number, and special entomological interests.

Active members - annual dues $5.00
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Back issues of the Maryland Entomologist and recent issues of Phaeton are available, to members, from the Treasurer. Phaeton is .25¢ per number and the Maryland Entomologist is $1.25 per copy.

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The Maryland Entomological Society is a non-profit, scientific organization. Meetings are held on the third Friday of every month (from October to May) at 8:00 p.m., in Lecture Hall #120 of the Biological Sciences Building, University of Maryland Baltimore County.

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Cover illustration: The logo of the Maryland Entomological Society features the Maryland Shield and a specimen of Euphydryas phaeton (Drury), the Baltimore checkerspot, which became the official insect for the state of Maryland through the efforts of many of the members of this Society.

AN ANNOTATED CHECKLIST OF THE CERAMBYCIDAE (COLEOPTERA) OF MARYLAND

C. L. Staines, Jr.

The Cerambycidae is a large family of beetles with 1200 species in the United States (Arnett, 1973). Members of this family are recognized by the unusually long antennae and the tarsi which are 5-5-5 but appear 4-4-4 with the minute fourth segment in the cleft of the bilobed third segment.

Adults feed on wood, roots, leaves or pollen. Larvae bore into roots and wood. Some species are very destructive.

The following checklist was derived from a literature search plus checking the following collections: E.J. Ford; Maryland Department of Agriculture; C.L. Staines; University of Maryland; and U.S. National Museum. A total of 253 species are listed as occurring in Maryland or the surrounding states. For each species the counties in which it has been collected are listed along with host information and a range of collection dates.

Parandrinae

Parandrini

Parandra (Neandra) brunnea brunnea (Fabricius). Anne Arundel, Baltimore, Montgomery, Prince Georges, Queen Annes, Talbot, Washington. May to September. Maple, linden, oak, poplar, chestnut, tulip poplar, elm, pear; light.

Prioninae

Mallaspini

Derancistrus taslei (Buquet). Montgomery. Larvae bore in dry, dead tops of hardwoods.

Prionini

Orthosoma brunneum (Forster). Anne Arundel, Baltimore, Kent, Prince Georges, Montgomery, Talbot. June to August. Light trap; decaying hardwoods and conifers in moist situations.

Prionus (Prionus) laticollis (Drury). Anne Arundel, Baltimore, Carroll, Frederick, Harford, Prince Georges, Talbot. June to September. Larvae feed on roots of living hardwoods.

P. (P.) pocularis Dalman. Anne Arundel, Montgomery, Prince Georges, Talbot. June to August. Pines.

P. (Neopolyarthron) imbricornis (L.). Anne Arundel, Calvert, Montgomery, Prince Georges. June to September. Hardwoods.

Aseminae

Asemini

Arhopalus rusticus obsoletus (Randall). Anne Arundel, Wicomico, Worcester. June to September. Larvae bore in bases and dead roots of pines.

Asemum striatum (L.). Anne Arundel, Baltimore, Frederick, Montgomery, Prince Georges, Somerset. April to May. Light; recently dead conifers.

Atimiini

Atimia confusa confusa (Say). Baltimore, Montgomery. Spring and fall. Dead cedar, arborvitae, bald cypress, juniper.

Cerambycinae

Disteniini

Distenia undata (Fab.). Calvert. July.

Smodicini

Smodicum cucujiforme (Say). Anne Arundel, Baltimore, Montgomery, Prince Georges, Washington. June to August. Light; locust, oak, beech, hackberry, willow, poplar, hickory.

Methiini

Oeme rigida rigida (Say). Baltimore, Montgomery, Talbot. May to July. Red cedar, bald cypress.
Tessaropa tenuipes (Haldeman). Baltimore City, Montgomery. June. Hickory, walnut, beech, oak, chestnut, redbud.

Graciliini

Gracilia minuta (Fabricius). State label only. May. Dead twigs and branches of hardwoods.

Hesperophanini

Eburia quadrigeminata (Say). Anne Arundel, Baltimore, Frederick, Montgomery, Prince Georges, St. Mary's, Talbot, Washington. May to August. Light; Heartwood of oak, ash, hickory, maple, elm, beech.
Tylonotus bimaculatus Haldeman. Baltimore, Harford, Montgomery. June to July. Light; ash, birch, black walnut, hickory, tulip poplar, elm, privet.
Hesperophanes pubescens (Haldeman). None seen. Linsley (1962) records from Massachusetts to Georgia. July to August. Light. Biology unknown.

Purpuricenini

Purpuricenus axillaris Haldeman. Garrett, Montgomery. June. Hickory, oak.
P. humeralis (Fabricius). Baltimore, Montgomery, Prince Georges. June to October. Hickory, birch, alder, oak, mulberry, black locust, maple, redbud.
Knulliana cincta cincta (Drury). Anne Arundel, Baltimore, Montgomery, Prince Georges, Queen Annes, Talbot. April to October. Larvae are found in dry, dead branches of walnut, hickory, oak, hackberry, pear, willow. Light.
Tragidion coquus (L.). None seen. Linsley (1962) records from New York to Florida, west to Texas, Oklahoma and Kansas. August to September. Larvae mine dead branches of oak.
Batyle suturalis suturalis (Say). Anne Arundel, Baltimore, Frederick, Montgomery, Prince Georges. June to August. Larvae mine small, dead twigs of hickory, oak; adults have been collected from wild carrot flowers.
B. ignicollis australis L. Prince Georges. July. Pine.

Pteroplatini

Elytroleptus floridanus (LeConte). Linsley (1962) records from southern Canada to Florida. May to June. Biology unknown.

Elaphidionini

Psyrassa unicolor (Randall). Anne Arundel, Baltimore, Calvert, Montgomery, Talbot, Washington. June to August. Light; larvae are twig girdlers on hickory, black walnut, oak, beech, redbud, mulberry.
P. pertenuis (Casey). Anne Arundel, Baltimore, Dorchester, Talbot. June to July. Light. Hickory, magnolia.
Stenosphenus pinorum Casey. Montgomery. May. Dead Limbs of hickory.
S. notatus (Olivier). Kent, Montgomery, Prince Georges, Washington, Worcester. March to May. Dead limbs of hickory and hackberry.
Aneflormorpha subpubescens (LeConte). Montgomery, Prince Georges. June to July. Oak.
Enaphalodes rufulus (Haldeman). Anne Arundel, Baltimore. June to July. Light; heartwood borer in oak and maple.
E. atomarius (Drury). Anne Arundel, Baltimore, Montgomery Prince Georges, Somerset, Talbot, Washington. June to August. Light; dead stumps and trees of oak, hackberry, walnut, hickory.
E. hispicornis (L.). Linsley (1963) records from New Jersey to Florida, west to California. July to October. Oak.
E. cortiphagus (Craighead). Perry (1977) reports from Pennsylvania and Virginia.
Elaphidion mucronatum (Say). Anne Arundel, Baltimore, Garrett, Montgomery, Prince Georges, Talbot. April to July. Light; dead branches of various hardwoods.
Elaphidionoides villosus (Fabricius). Anne Arundel, Baltimore, Montgom-

ery, Prince Georges, Washington, Worcester. May to August. Hardwoods; light.
E. parallelus (Newman). Anne Arundel, Baltimore, Montgomery, Somerset, Worcester. May to June. Light; hardwoods.
E. incertus (Newman). Anne Arundel, Baltimore, Montgomery, Washington. July to August. Mulberry, oak, hickory.
E. aspersus (Haldeman). Linsley (1963) reports from Atlantic Coast. Oak, hickory.
Anelaphus pumilus (Newman). Anne Arundel, Baltimore Montgomery. April to June. Light; oak, elm, linden, hickory.
Micranoplium unicolor (Haldeman). Baltimore, Montgomery. June to July. Light.

Ibidionini

Heterachthes ebenus Newman. Prince Georges. May to June. Pines.
H. pallidus Haldeman. Anne Arundel, Baltimore, Baltimore City, Montgomery. May to August. Light; hickory, tulip poplar.

Curiini

Curius dentatus Newman. Montgomery, Somerset. July. Light; wax myrtle, pines, juniper, maple.

Obriini

Obrium rubidium LeConte. Linsley (1963) reports from eastern No. America.
O. rufulum Gahan. Baltimore, Montgomery. June to July. Light; ash.
O. maculatum (Olivier). Baltimore, Montgomery, Prince Georges, Talbot. May to August. Light; hardwoods.

Molorchini

Molorchus bimaculatus bimaculatus Say. Allegany, Baltimore, Montgomery, Prince Georges, Somerset, Talbot. April to May. Flowers of dogwood, viburnum. Larvae mine dead branches of hardwoods.

Stenopterini

Callimoxys sanguinicollis sanguinicollis (Olivier). Garrett. June. Ceanothus spp. (Rhamnaceae). Reared from dead hickory.

Callichromini

Plinthocoelium suaveolens suaveolens (L.). Linsley (1964) reports from Delaware to Florida. May to July. Mulberry, persimmon.

Dryobiini

Dryobius sexnotatus Linsley. Montgomery, Somerset. June to July. Elm, maple, beech, linden (prefers standing, overmature trees).

Callidiini

Pronocera collaris collaris (Kirby). Linsley (1964) reports from New Hampshire to North Carolina. June to August. Spruce, pine.
Hylotrupes bajulus (L.). Baltimore, Baltimore City, Kent, Montgomery, Prince Georges, Somerset, Talbot, Washington. June to September. Light; pine, spruce, fir.
Semanotus ligneus ligneus (Fabricius). Anne Arundel, Baltimore, Montgomery. April to June. Juniper, arborvitae.
Callidium violaceum (L.). Montgomery, Prince Georges. April to May. Pine, larch, spruce.
C. schotti Schaeffer. Linsley (1964) reports from the northeastern United States.
C. antennatum antennatum Newman. Prince Georges. May. Pine, spruce.
C. texanum Schaeffer. Linsley (1964) reports from eastern United States. Red cedar.
C. frigidum Casey. Linsley (1964) reports from Atlantic states to Virginia. Juniper, arborvitae.
Phymatodes varius (Fabricius). Prince Georges. May. Oak, hickory.
P. amoenus (Say). Anne Arundel, Baltimore, Baltimore City, Howard, Montgomery, Prince Georges. March to May. Light; grape.
P. ater LeConte*. Linsley (1964) reports from Nova Scotia to Pennsylvania. This species may occur in Maryland.

P. lengi Joutel. Baltimore City. June.
P. testaceus (L.). Anne Arundel, Baltimore, Baltimore City, Caroline, Kent, Montgomery, Prince Georges, Worcester. March to June. Light; oak, beech, hickory.
P. aereus (Newman). Linsley (1964) reports from Canada to Georgia. Oak.
Physocnemum brevilineum (Say). Montgomery. June to August. Elm.
P. violaceipenne Hamilton. Prince Georges. May to June. White oak.
Ropalopus sanguinicollis (Horn). Linsley (1964) reports from northeastern United States. June and July. Prunus spp.

Clytini

Megacyllene robiniae (Forster). Allegany, Anne Arundel, Baltimore, Charles, Howard, Montgomery, Prince Georges, St. Marys, Talbot, Washington. August to October. Goldenrod; locust.
M. caryae (Gahan). Baltimore, Carroll, Cecil, Frederick, Howard, Prince Georges. March to May. Hickory, walnut.
M. decora (Olivier). Linsley (1964) reports from New York and North Carolina.
Glycobius speciosus (Say). Linsley (1964) reports from northeastern United States. Maple.
Calloides nobilis nobilis (Harris). Frederick. August. Oak, ash.
Saroseslhes fulminans (Fabricius). Montgomery. June. Chestnut, oak, walnut.
Xylotrechus sagittatus sagittatus (Germar). Anne Arundel, Montgomery, St. Mary's, Somerset, Talbot. June to October. Light; pine, fir, spruce.
X. colonus (Fabricius). Anne Arundel, Baltimore, Baltimore City, Caroline, Cecil, Montgomery, Prince Georges, Talbot, Washington. May to September. Light; oak, maple, hickory, ash.
X. integer (Haldeman). Linsley (1964) reports from northeastern United States. Fir, hemlock.
X. convergens LeConte. Linsley (1964) reports from eastern United States. Hawthorn.
X. nitidus (Horn). Garrett. June.
X. quadrimaculatus (Haldeman). Linsley (1964) reports from northeastern United States. Birch, alder, beech.
X. aceris Fisher. Baltimore. September. Maple.
Neoclytus scutellaris (Olivier). Anne Arundel, Baltimore, Carroll, Harford. July to August. Oak, hickory, elm grape.
N. mucronatus mucronatus (Fabricius). Baltimore, Montgomery, Prince Georges. June to September. Hickory.
N. jouteli jouteli Davis. Linsley (1964) reports from New Jersey and Virginia. Light.
N. acuminatus acuminatus (Fabricius). Anne Arundel, Baltimore, Baltimore City, Kent, Montgomery, Prince Georges, Talbot, Washington, Wicomico. April to July. Hardwoods.
N. caprea (Say). Linsley (1964) reports from Pennsylvania and North Carolina. Have seen a large series from Great Falls, Va. (20/IV/1916). Ash, hickory, oak, elm.
Clytus ruricola (Olivier). Baltimore, Cecil, Garrett, Harford. April to July. Hemlock, maple, hickory, birch.
C. marginicollis (Castelnau & Gory). Anne Arundel. Pines.
Clytoleptus albofasciatus (Castelnau & Gory). Anne Arundel, Frederick, Howard, Montgomery, Prince Georges. May to September. Light; grape, hickory.

Anaglyptini

Tilloclytus geminatus (Haldeman). Prince Georges. April. Hickory, oak.
Cyrtophorus verrucosus (Olivier). Baltimore, Garrett, Montgomery, Worcester. April to June. Hardwoods.
Microclytus gazellula (Haldeman). Linsley (1964) reports from eastern United States.
M. compressicollis (Castelnau & Gory). Linsley (1964) reports from northeastern United States.

Tillomorphini

Euderces pini (Olivier). Somerset. September. Hercules club.
E. picipes picipes (Fabricius). Allegany, Baltimore, Carroll, Frederick, Montgomery, Talbot, Prince Georges. May to July. Light; hardwoods.

Rhapalophorini

Rhapalophora longipes longipes (Say). Allegany, Baltimore, Montgomery. June to July. Redbud, dogwood.

Lepturinae

Desmocerini

Desmocerus palliatus (Forster). Frederick, Garrett, Montgomery, Washington. May to July. Sambucus spp.

Necydalini

Necydalis mellita (Say). Anne Arundel. May. Light; oak, chestnut.

Lepturini

Leptorhabdium pictum (Haldeman). Garrett, Montgomery. June. Birch, dogwood, oak, hickory.
Centrodera descolorata (Harris). Allegany, Garrett. May to June. Tulip poplar, oak, beech, walnut, maple.
C. sublineata LeConte. Montgomery. April. Light.
Stenocorus cylindricollis (Say). Linsley & Chemsak (1972) report from eastern United States. Have seen specimens from Great Falls, Va. (VI/1926).
S. schaumi (LeConte). Linsley & Chemsak (1972) report from Pennsylvania and Virginia. Ash, beech, maple.
S. cinnamopterus (Randall). Linsley & Chemsak (1972) report from eastern United States.
S. vittiger (Randall). Allegany, Baltimore. May to July.
Encyclops coerulea (Say). Garrett. May. Oak, maple, walnut.
Evodinus monticola monticola (Randall). Garrett. May. Hemlock, fir, spruce, pine; flowers of dogwood, viburnum.
Anthophylax attenuatus (Haldeman). Garrett. May. Maple, beech, poplar.
A. cyaneus (Haldeman). Linsley & Chemsak (1972) report from eastern United States. Birch, beech, maple.
A. viridis LeConte. Linsley & Chemsak report from eastern United States. Birch, beech, maple.
Rhagium inquisitor (L.). Allegany, Anne Arundel, Baltimore, Caroline, Frederick, Talbot, Prince Georges, Worcester. March to September. Conifers.
Sachalinobia rugipennis rugipennis (Newman). Linsley & Chemsak (1972) report from northeastern United States. Spruce, pine.
Gaurotes cyanipennis (Say). Allegany, Anne Arundel, Baltimore, Frederick, Garrett, Montgomery, Wicomico. May to June. Light; dogwood, oak, walnut.
G. thoracica (Haldeman). Linsley & Chemsak (1972) report from eastern United States.
Acmaeops proteus (Kirby). Linsley & Chemsak (1972) report from eastern United States. Pine, spruce, hemlock, fir (recently dead).
A. discoideus (Haldeman). Linsley & Chemsak (1972) report from eastern United States. Have seen specimens from New Jersey and Pennsylvania. Virginia pine.
Pseudogaurotina abdominalis (Bland). Linsley & Chemsak (1972) report from northeastern United States.
Brachysomida bivittata (Say). Allegany, Garrett. May to June.
Gnathacmaeops pratensis (Laicharting). Linsley & Chemsak (1972) report from Appalachian Mountains south to Georgia. Spruce, pine.
Metacmaeops vittata (Swederus). Baltimore, Frederick, Montgomery. June to July. Tulip poplar.
Strangalia luteicornis (Fabricius). Anne Arundel, Baltimore, Cecil, Frederick, Montgomery, Prince Georges, Washington. May to September. Viburnum, beech, grape.
S. famelica famelica Newman. Baltimore, Frederick, Harford, Montgomery, Prince Georges. June to August. Chestnut, oak, birch.
S. bicolor (Swederus). Frederick, Montgomery, Prince Georges. June to July. Maple, oak.
S. acuminata (Olivier). Baltimore, Montgomery, Prince Georges, Somerset, Worcester. May to June. Alder, viburnum.
Bellamira scalaris (Say). Allegany, Baltimore City, Harford, Howard, Montgomery, Prince Georges, Somerset. June. Poplar, beech, hickory, willow; flowers of viburnum, sumac.
Analeptura lineola (Say). Anne Arundel, Baltimore, Baltimore City, Frederick, Garrett, Montgomery. May to July. Birch, pine.
Charisalia americana (Haldeman). Linsley & Chemsak (1976) report from

eastern United States. Tulip poplar, persimmon.
Alosternida chalybea (Haldeman). Linsley & Chemsak (1976) report from eastern United States.
Grammoptera exigua (Newman). Anne Arundel, Baltimore, Garrett. May to June. Light; poplar, linden.
G. haematites (Newman). Talbot. May to June.
G. subargentata (Kirby). Perry (1977) reports from Pennsylvania and Virginia. Poplar; flowers of rose, dogwood.
Judolia cordifera (Olivier). Allegany, Anne Arundel, Baltimore, Montgomery, Prince Georges. June to July. Milkweed flower; chestnut.
Idiopidonia pedalis (LeConte). Linsley & Chemsak (1976) report from Appalachian region south to Georgia.
Typocerus octonotatus (Haldeman). Prince Georges. June. Various grasses.
T. acuticauda acuticauda Casey. Anne Arundel, Montgomery, Prince Georges. May to June. Spirea flowers.
T. zebra (Olivier). Anne Arundel, Montgomery, Prince Georges, Somerset, Talbot, Worcester. June to July. Pine.
T. velutinus velutinus (Olivier). Carroll, Cecil, Charles, Frederick, Garrett, Harford, Montgomery, Prince Georges. June to August. Hardwoods; flowers of spirea, milkweed.
T. deceptus Knull. Prince Georges. June. Sumac flowers.
T. lunulatus lunulatus (Swederus). Baltimore, Montgomery, Prince Georges. June to July. Pine; flowers of wild carrot.
T. lugubris (Say). Allegany, Baltimore, Carroll, Frederick, Montgomery, Prince Georges. May to July. Pine.
Neoalosterna capitata (Newman). Baltimore. May. Flowers of dogwood, viburnum, hydrangea.
Pseudostrangalia cruentata (Haldeman). Linsley & Chemsak (1976) report from eastern United States. Flowers of dogwood, horsechestnut, rose.
Leptura (Stenura) emarginata Fabricius. St. Mary's. July. Elm, beech, oak, birch, maple.
L. (S.) subhamata Randall. Montgomery. June. Hemlock, pine; flowers of spirea.
L. (L.) abdominalis (Haldeman). Linsley & Chemsak (1976) report from New Jersey to Mississippi. Juniper.
L. (L.) lineola Say. Carroll, Cecil, Frederick, Garrett, Montgomery, Prince Georges. June to July.
Trachysida mutabilis (Newman). Baltimore City, Frederick, Garrett, Howard, Montgomery, Somerset, Talbot. April to July. Hardwoods.
Pidonia (Pidonia) aurata (Horn). Garrett. June. Flowers of rhododendron, hydrangea, dogwood.
P. (P.) ruficollis (Say). Frederick, Garrett. May to June. Chestnut; flowers of rose, dogwood (especially in partial shade).
P. (P.) densicollis (Casey). Garrett, Prince Georges. June to July. Flowers of rhododendron, hydrangea, dogwood.
Strangalepta abbreviata (Germar). Allegany, Baltimore, Calvert, Cecil, Carroll, Frederick, Garrett, Howard, Montgomery, Prince Georges. June to July. Fir, pine, spruce, juniper, hemlock, larch, poplar, maple; flowers of rose, viburnum, spirea, chrysanthemum.
S. pubera (Say). Frederick, Garrett. June to October. Elm, walnut, pine.
S. canadensis canadensis (Olivier). Linsley & Chemsak (1976) report from northeastern United States. Fir, hemlock, pine. Have seen specimens from Pennsylvania and West Virginia.
Xesoleptura octonotata (Say). Garrett. May to June. Oak.
Lepturopsis biforis (Newman). Frederick, Garrett. June to July. Chestnut, poplar, pine, hemlock.
Trigonarthris minnesotana (Casey). Linsley & Chemsak (1976) report from eastern United States. Hardwoods.
T. proxima (Say). Baltimore, Montgomery. June. Maple, hickory, linden; flowers of spirea, chrysanthemum, dogwood.
Brachyleptura rubrica (Say). Baltimore, Frederick, Harford, Howard, Montgomery, Prince Georges. June to July. Hickory, beech, oak.
B. circumdata (Olivier). Baltimore, Montgomery. May to July.
B. vagans (Olivier). Anne Arundel, Baltimore, Montgomery, Prince Georges, Somerset, Talbot. June to July. Pine, hemlock, birch, hickory, walnut; flowers of spirea.
B. champlaini Casey. Linsley & Chemsak (1976) report from eastern United States.
Strophiona nitens (Forster). Cecil, Frederick, Garrett, Montgomery, Somerset. May to July. Oak, chestnut, hickory, walnut, beech.

Lamiinae

Monochamini

Goes debilis LeConte. Montgomery, Worcester. June to July. Light; oaks.
G. pulcher (Haldeman). Montgomery, Prince Georges. Oak, hickory.
G. pulverulentus (Haldeman). Montgomery. Oak, beech, elm.
G. tesselatus (Haldeman). Dillon and Dillon (1941) report from Maryland. Oak.
G. tigrinus (DeGreer). Dillon and Dillon (1941) report from Maryland. Oak
Microgoes oculatus (LeConte). Dillon and Dillon (1941) report from Maryland. Hickory, oak, beech.
Hebestola nebulosa Haldeman. Anne Arundel, Baltimore. July. Light; oak.
Plectrodera scalator (Fabricius). Dillon and Dillon (1941) report from Pennsylvania and Georgia. Poplar.
Monochamus scutellatus scutellatus (Say). Anne Arundel, Baltimore, Prince Georges. May to October. Pines.
M. notatus (Drury). Prince Georges. Biology unknown.
M. carolinensis (Olivier). Montgomery, Prince Georges, Worcester. May to August. Light; pine.
M. titillator (Fabricius). Cecil, Montgomery, Prince Georges, Talbot, Washington, Worcester. June to August. Pine, fir.
M. marmorator Kirby. Dillon and Dillon (1941) record from Maine to North Carolina, west to the Great Lakes. Fir.

Dorcaschematini

Dorcaschema alternatum (Say). Anne Arundel, Baltimore, Kent, Montgomery. June to August. Biology unknown.
D. nigrum Say. Dillon and Dillon (1947) record from Maryland. May to July. Biology unknown.
D. wildi Uhler. Baltimore. June. Mulberry.
D. cinereum (Olivier). Baltimore, Montgomery. June to July. Light.

Ataxiini

Ataxia crypta (Say). Montgomery, Prince Georges. April to July.

Apodasyini

Eupogonius subarmatus (LeConte). District of Columbia. June.
E. tomentosus (Haldeman). Montgomery, Talbot. June to July. Light.
E. pauper LeConte. Anne Arundel, Baltimore, Montgomery, Somerset. June to July.
Psenocerus supernotatus (Say). Baltimore, Prince Georges, Somerset, Talbot, Washington, Worcester. April to July.

Pogonocherini

Pogonocherus (Pogonocherus) penicillatus LeConte. Linsley (1935) records from eastern North America to Rocky Mountains. Spruce.
P. (Eupogonocherus) mixtus Haldeman. Baltimore, Prince Georges. June to July. Light; pine, spruce.
Ecyrus dasycerus dasycerus (Say). Anne Arundel, Baltimore, Baltimore City, Frederick, Harford, Prince Georges, Somerset, Talbot, Wicomico. May to August. Light; oak, maple, locust, linden.

Onciderini

Oncideres cingulata cingulata (Say). Anne Arundel, Baltimore, Calvert, Caroline, Montgomery, St. Marys. June to October. Light; walnut.

Hippopsini

Hippopsis lemniscata (Fabricius). Anne Arundel, Baltimore, Montgomery, Prince Georges, Somerset, Talbot, Washington. June to September.

Acanthoderini

Aegomorphus modestus (Gyllenhal). Anne Arundel, Baltimore, Montgomery, Talbot, Worcester. June to August. Light.
A. morrisi (Uhler). Linsley & Chemsak (1984) record from eastern North America.
A. quadrigibbus (Say). Baltimore City, Prince Georges. June to August.

Acanthocini

Acanthocinus (Tylocerina) nodosus (Fabricius). Worcester. June. Light.
A. (Neacanthocinus) obsoletus (Olivier). Dillon (1966) records from Maryland.
Ceratographis biguttata (LeConte). Somerset. July. Light.
Graphisurus fasciatus (DeGree). Anne Arundel, Baltimore, Cecil, Charles, Harford, Montgomery, Prince Georges, Somerset, Talbot, Worcester. June to August. Light; hickory, maple.
G. triangulifer (Haldeman). Chemsak and Linsley (1975) record from eastern North America. I have one specimen from Virginia, 26 July 1976.
G. despectus (DeGreer). Montgomery. May to July. Light.
Astylidius versutus versutus Casey. Montgomery. July. Light.
A. parvus (LeConte). Montgomery. August. Light.
Amniscus macula (Say). Baltimore, Baltimore City, Frederick, Garrett, Montgomery, Prince Georges, Worcester. April to August. Holly.
A. sexguttata (Say). Anne Arundel, Prince Georges, Talbot, Worcester. June to August. Light.
A. collaris (Haldeman). Anne Arundel. June.
A. arcuatus arcuatus (LeConte). St. Marys, Somerset. June to August. Light.
Leptostylus transversus transversus (Gyllenhal). Baltimore, Montgomery, Talbot. May to September. Light.
L. albescens (Haldeman). Anne Arundel, Somerset, Washington. April to October. Sweet gum.
Leptostylopsis planidorsus (LeConte). Baltimore, Talbot. April to July. Light.
Styloleptus biustus biustus (LeConte). Worcester. August.
Sternidius alpha alpha (Say). Washington. June.
S. alpha vicinus (Haldeman). Anne Arundel, Montgomery.
S. moderator (Casey). Baltimore, Montgomery, Talbot, Wicomico. June to September. Maple, mulberry.
S. fascicularis fascicularis (Harris). Anne Arundel, Baltimore City, Montgomery, Talbot. April to August.
Astyleiopus variegatus (Haldeman). Anne Arundel, Baltimore, Montgomery, Prince Georges, Talbot. May to July. Light.
Dectes savi Dillon & Dillon. Dillon (1956c) records from New Jersey and Pennsylvania.
D. texanus texanus LeConte. Baltimore, Baltimore City, Calvert, Montgomery, Prince Georges, Queen Annes, Talbot, Washington, Worcester. June to August.
Lepturges confluens (Haldeman). Anne Arundel, Baltimore, Baltimore City, Montgomery, Somerset, Worcester. June to August. Light.
L. angulatus angulatus (LeConte). Dillon (1956c) reports from Maryland.
L. pictus (LeConte). Dillon (1956c) reports from Pennsylvania and Ohio.
Maculurges regularis (LeConte). Baltimore. June.
Urgleptes signatus (LeConte). Anne Arundel, Baltimore, Baltimore City, Montgomery, Worcester. June to August. Light.
U. querci (Fitch). Baltimore, Baltimore City, Prince Georges, Washington. May to August. Light; ash, maple.
U. facetus (Say). Anne Arundel, Montgomery, Prince Georges. May to July.
Hyperplatys maculata Haldeman. Anne Arundel, Baltimore, Baltimore City, Montgomery, Prince Georges. May to August. Light.
H. aspersa (Say). Anne Arundel, Baltimore, Montgomery. May to July. Light; cherry.
Nyssodrysina haldemani (LeConte). Dillon (1956a) reports from Maryland.

Cyrtinini

Cyrtinus pygmaeus Haldeman. Montgomery, Prince Georges. May to June.

Saperdini

Saperda calcarata Say. Garrett. July. Poplar.
S. candida candida Fabricius. Baltimore, Washington. August. Apple, mountain ash, shad bush.
S. concolor unicolor Felt & Joutel. Felt and Joutel (1907) report from Pennsylvania and New Jersey. Willow.
S. cretata Newman. Felt and Joutel (1907) report from Pennsylvania and New Jersey. Apple, crabapple, shadbush.
S. discoidea Fabricius. Baltimore, Harford, Montgomery, Prince Georges. June to July. Light; hickory (prefers declining trees).
S. fayi Blanchard. Felt and Joutel (1907) report from Pennsylvania and New Jersey. Hawthorn.
S. imitans Felt & Joutel. Felt and Joutel (1907) report from Pennsylvan-

ia and Virginia.
S. lateralis Fabricius. Allegany, Baltimore, Frederick, Montgomery, Prince Georges. June to July. Light; hickory.
S. obliqua Say. District of Columbia. Alder.
S. populnea moesta LeConte. Felt and Joutel (1907) report from Penna.
S. punctticollis Say. Prince Georges. June. Virginia creeper, poison ivy.
S. tridentata Olivier. Anne Arundel, Baltimore City, Howard, Montgomery, Prince Georges, Washington. April to July. Light; elm.
S. vestita Say. District of Columbia. May to June. Linden.

Phytoecini

Oberea schaumi quadricallosa LeConte. Montgomery. June to July. Poplar.
O. ocellata Haldeman. Baltimore, Montgomery, Prince Georges, Worcester. June to July. Sumac.
O. gracilis (Fabricius). Prince Georges.
O. ruficollis (Fabricius). Anne Arundel, Dorchester, Frederick, Prince Georges, Talbot, Worcester. July to October. Sassafras.
O. tripunctata (Swederus). Anne Arundel, Baltimore, Baltimore City, Cecil, Montgomery, Prince Georges. May to August. Alder, rhododendron.
O. bimaculata basalis (LeConte). Anne Arundel, Baltimore, Garrett, Montgomery, Prince Georges, Talbot, Worcester. May to July. Raspberry, blackberry, phlox.
O. b. perspicillata Haldeman. Montgomery, Prince Georges. April to June.
O. b. umbra Casey. Montgomery. June.
O. b. insignis Casey. Specimens seen from New Jersey and Tennessee.

Tetraopini

Tetraopes melanurus Schonherr. Anne Arundel, Baltimore, Charles, Dorchester, Prince Georges, Talbot. June to September. Asclepias tuberosa.
T. tetraophthalmus (Forster). Anne Arundel, Baltimore, Caroline, Carroll, Kent, Montgomery, Prince Georges, Queen Annes, Talbot, Washington. June to September. Asclepias spp.
Phaea monostigma (Haldeman). Montgomery, Prince Georges. June to September. Morning glory.
Amphionycha marginata (Fabricius). Prince Georges. July.

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SOME ARTHROPODS FOR NATURAL CONTROL OF APHIDS ON HICKORIES AND WALNUTS

Theodore L. Bissell

In the course of studies on aphids on hickories and walnuts (Juglandaceae) in various parts of the United States over a number of years, several parasites and predators associated with the aphids have been encountered. Most of the parasites collected were Aphelinus perpallidus Gahan, (Aphelinidae), and six specimens of Alloxysta spp., (Charipidae), both Hymenoptera. Larval conopterigids (Neuroptera) and mites (Acari) were found to be predators on the aphids. Seven species of aphids, all in the tribe Drepanosiphini, were involved in these studies.

Aphelinus perpallidus (Gahan)

This species was described in 1924 and the reported host was an aphid on elm, collected in Sioux City, Iowa. Gordh (1979) extended the distribution to include Ontario, New York, Oregon and California; and he listed as hosts Chromaphis juglandicola (Kaltenbach); Monellia costalis (Fitch) and Monellia spp. on both pecan and hickory; and Myzocallis fumipennella (Fitch). (M. costalis is a synonym of M. caryella (Fitch) and for the last read Melanocallis caryaefoliae (Davis) as per Bissell (1978)).

A. perpallidus has been noted a number of times in publications on pecan and walnut insects treated as pests. Moznette, Bissell and Adair (1931) with scattered observations across the South said the combination ladybird beetles, lacewing flies and A. perpallidus "cut down the numbers of aphids enormously."

Van den Bosch et al (1962) reported it attacking the walnut aphid, Chromaphis juglandicola, in California "on occasion", but stated "it contributes little or nothing to its control."

Tedders (1978) made a careful study of pecan aphids in Georgia. He found perpallidus active from April to November and usually most evident in October. Data are given on species and stages of aphids attacked and on the development of the parasite.

Watterson and Stone (1982), working on pecans on irrigated lands of western Texas, found an association of A. perpallidus and supposed hyperparasites in all of six localities sampled but in only two of these did the number of perpallidus seem sufficient to warrant continued study. At times in late summer they recorded parasitisms of 58 and 38 percent.

Rearings

In 1969, Dr. B.D. Burks (now retired) USNM, Entomology Research Division, identified for me, 33 reared specimens of A. perpallidus with host, locality, date, tree host and one or more parasites reared from as many aphid hosts, as follows:

Monellia caryella (Fitch). Downsville NY, 13 Jan. 68 on Carya cordiformis; Princess Anne MD, 10 June 66 on C. illinoensis; Salem NY, 11 June 68 on C. tomentosa - 3 parasites; and Washington DC*, 8 Oct. 67 on C. tomentosa - 4 parasites.

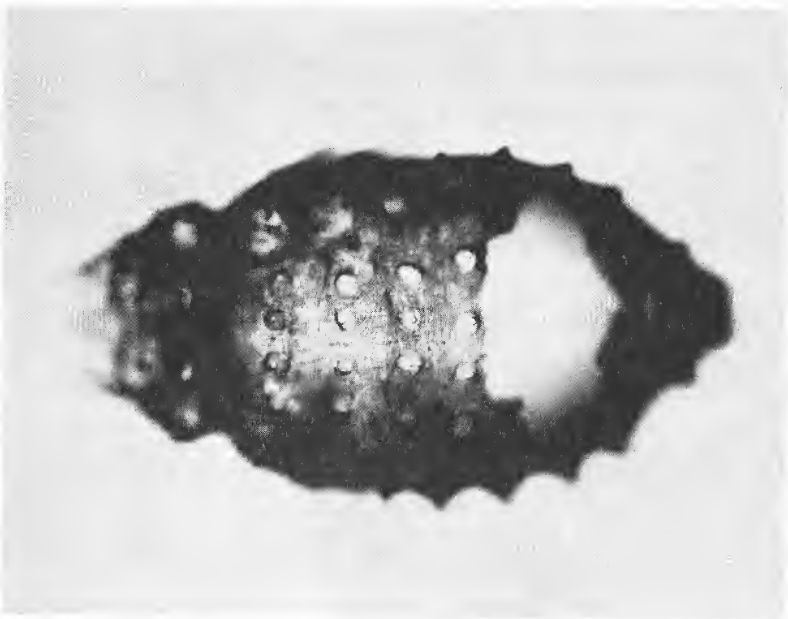

Figure 1. Mummy of *Monelliopsis nigropunctata*, Georgetown DE, 9 Aug 1966.

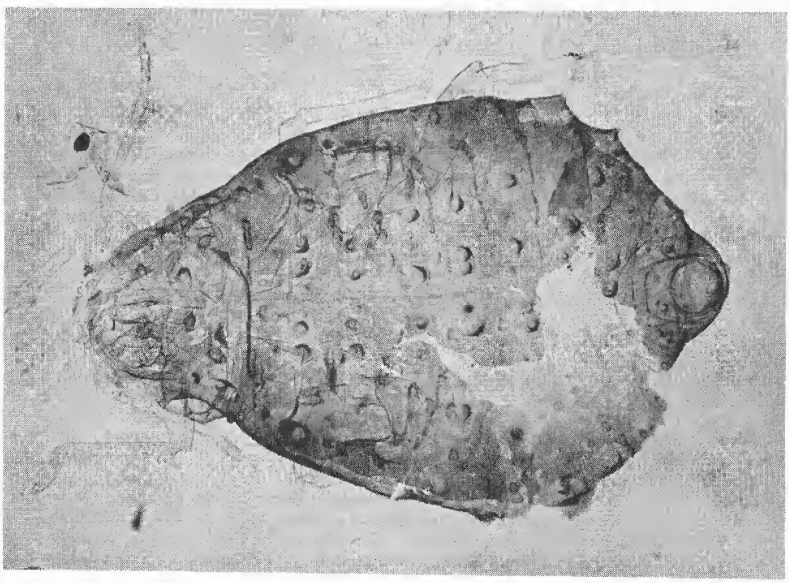

Figure 2. Mummy of *Monelliopsis* spp., undescribed, National Arboretum, Washington DC, 13 Jun 1966, host of black parasite, presumed to be *Alloxysta* spp.

Monellia microsetosa Richards. College Park MD, 15 Oct. 67 on C. cordiformis - 3 parasites from oviparae; Washington DC, 29 June 66 from vivipara, and 30 Sept. 55, from male on C. tomentosa.

Monelliopsis caryae (Monell). Colesville MD, 26 Aug. 67 on Juglans nigra.

Monelliopsis nigropunctata (Granovshy). Bittinger MD**, 14 Sept. 66 on C. ovata; California MD, 6 Aug. 67 on C. tomentosa - 2 parasites; Georgetown DE, 9 Aug. 66 on C. tomentosa - 2 parasites; Salem NY, 17 Aug. 67 - 2 parasites and 11 June 68 - 2 parasites on C. ovata; State College PA, 25 Sept. 67 on Carya spp. and 26 Sept. 67 on C. ovata; Washington DC, 30 Sept. 67 on C. ovalis-obcordata - 2 parasites.

Melanocallis caryaefoliae (Davis). Salem NY, 17 Aug. 67 on C. cordiformis - 3 parasites.

In addition to the records from Dr. Burks' determinations, there are a few more made by other persons:

Monellia caryella. Thomasville GA, July 29 on pecan, parasite emerged and identified by person in Washington (probably A.G. Gahan); Experiment GA, 13 May 31 on pecan - 4 parasites identified by the writer.

Monellia microsetosa. Bowie MD, 8 Sept. 73 on Carya pallida - 1 parasite identified by the writer.

Aphids parasitized by A. perpallidus turn bluish black and are easily detected among the live aphids which are yellow, or dark green in the case of Melanocallis. The aphid bodies become fully distended and the surface features - tubercles, skin wrinkles, setae and sutures - stand out, with the result that the mummies, as they are called, are useful for taxonomic study. The emerging adult tears a rough hole in the posterior of the abdomen but the head, thorax and first three or four segments of the abdomen usually remain undamaged (Fig. 1). The dead aphid is held to the leaf by its claws.

Apparently these parasites overwinter within the mummified aphids on the leaves.

Alloxysta spp.

Six reared specimens were determined as Charips spp. by Burks. One male has been reexamined by Dr. Arnold Menke SEL, USDA and identified as Alloxysta spp., family Charipidae. Data on the six by aphid hosts:

Monellia caryella. Salem NY, 7 July 65 on Juglans cinerea and 12 June 68 on Carya ovata. (Cinerea is not a true host, the aphid is considered a stray upon it.)

Monelliopsis nigropunctata. Lexington Park MD, 12 Aug. 67 on C. tomentosa - 3 parasites.

Monelliopsis spp. undescribed. Washington DC, 13 June 66 on C. tomentosa - 3 parasites.

Aphids parasitized by Alloxysta spp. turn bluish black as with A. perpallidus; Figure 2 refers to the last collection above.

These rearings of Aphelinus and Alloxysta are from more than 5,000 aphids collected over a period of 20 years from eleven states, California to New York. From six localities where the collections were repeated over a period of 3 to 8 years, 4 in Maryland and 1 each in New York and the District of Columbia, and involving 4,516 aphids, those with parasites were quite low - 0.9 to 3.9 percent, weighted average 2.7 percent. Thus the parasites alone have not been an appreciable factor in control.

Acari - Erythraeidae

Larval mites of the genus Erythraeus occasionally prey on this group of aphids. The mites attach to the dorsal surface of their hosts to feed and may cause them to collapse.

Records: Experiment GA, June 32 on Melanocallis caryaefoliae; Lexington Park MD, 29 Aug. 65 and 4 June 67 on Monelliopsis nigropunctata; National Arboretum, Washington DC, 10 June 67 on M. nigropunctata. The Melanocallis was in the adult stage, the others were alatoid nymphs. These mites were determined by Dr. E.W. Baker, USDA, SEL. Beltsville, MD.

Coniopterygidae

Larvae of this family, apparently all of one species, were collected with aphids five times.

* All Washington collections made at National Arboretum.
** Bittinger collections made at University of Maryland 4H Camp.

Records: College Park MD, 17 & 22 Sept. 69 on Monellia caryella and 6 Aug. 73 on Protopterocallis canadensis; Shreveport LA, 12 Sept. 69 on Monellia caryella.

The adults are called dusty-wings and are the smallest (3mm) of the Neuropters (Borer et al. 1981). One larva was identified by Dr. O.S. Flint, USDA, Ent. Res. Div., in 1969.

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THE SILPHIDAE (COLEOPTERA) OF MARYLAND

C. L. Staines, Jr.

The Silphidae (carrion beetles) are a group of large (usually more than 10 mm.) common beetles in this area. The preferred habitat is carrion or occasionally decaying vegetation. Some species can be taken at lights.

The nomenclature of this group is unstable. Many of the recent papers have confused the issue. Arnett (1973) stated that there are 564 species world-wide. The largest number of species occurs in Europe with very few in tropical areas. A total of 46 species are recorded for North America with 17 from the Maryland area.

Key to the Maryland genera

(adapted from Arnett, 1973)

1. Elytra tricostate or smooth.....2
   Elytra nine-striate.....Necrophilus
2. Antennae distinctly eleven-segmented, second segment about as long as third, antenna either slender or gradually clavate.....3
   Antennae apparently ten-segmented, the second segment being very short, more or less hidden in tip of the first, last four segments forming a distinct club.....Nicrophorus
3. Occiptal ridge prominent.....Necrodes
   Occiptal ridge not prominent.....4
4. Eyes normal, protruding somewhat from head; head normal or elongate, not short, round, or compact.....Silpha
   Eyes very small, not or only very slightly protruding from head; head short, round, and compact.....Blitophaga

Necrodes

Necrodes surinamensis (Fabricius)

Description: Broadly oblong, depressed; black or piceous; elytra with an orange-red crossbar near apex, often broken into spots and sometimes entirely absent. Pronotum oval. Elytra slightly wider posteriorly. Length 12-25 mm. This species is quite variable in a number of characters.

Ecology: Ratcliffe (1972) states that adults are primarily predators on fly maggots (Calliphoridae) but carrion is also consumed. This species does not show any preference to the type of carrion (Ratcliffe, 1972). The winter is spent as adults. Activity begins as soon as winter conditions ameliorate sufficiently. Shubeck (1971) found this to be a nocturnal species.

Range: North America east of the Rocky Mountains, Montana, Idaho, Oregon, and Washington.

Specimens examined: ANNE ARUNDEL CO.: Friendship, 17/IV/61, 9/VI/62. MONTGOMERY CO.: Bethesda, 19/VI/52. PRINCE GEORGES CO.: College Park, 11/VII/72, 11/VIII/72; Beltsville, 8/IX/70, 22/VI/71. QUEEN ANNES CO.: Kent Island, 25/II/65; Wye Island, 6/VI/81. WASHINGTON CO.: Hagerstown, 4/VII/16; Sharpsburg, 15/VI/68. WICOMICO CO.: no locality, IX/76. WORCESTER CO.: Pocomoke Swamp, 10/X/70; no locality, Fall 1979.

Silpha

(modified from Dillon & Dillon, 1961)

1. Pronotum densely pubescent; elytral intervals with regular, distinct tubercles.....lapponica
   Pronotum never hairy; elytral intervals smooth or with irregular raised lines.....2
2. Pronotum uniformly dark, without pale side margins.....inaequalis
   Pronotum with disc dark, side margins yellowish.....3
3. Pronotum with reddish-yellow side margins, reddish-yellow narrowly margining the base; length less than 15 mm.....noveboracensis
   Pronotum with sides and base broadly margined with yellow, apex narrowly so; length more than 15 mm.....americana

Silpha americana L.

Description: Broadly oval, depressed. Pronotum yellow with black disc. Elytra brownish with darker elevations. Pronotum nearly twice as wide as long. Elytra with three distinct costae. Length 16-20 mm.

Ecology: This species may be found on carrion or fungi. Cole (1942) found that this species was equally active on carrion in wooded areas and exposed locations. Shubeck (1971) found this species was active during the day.

Range: East of a line drawn from Hudson Bay to Texas.

Specimens examined: ALLEGANY CO.: Green Ridge State Forest, 28/VI/80. ANNE ARUNDEL CO.: Arnold, 24/VII/78; Millersville, 2/VIII/78. BALTIMORE CO.: Granite, 30/V/66; Hebbville, VIII/63; Pikesville, 30/VII/78. FREDERICK CO.: Frederick, 13/VI/74; Mt. Airy, 26/VII/78. MONTGOMERY CO.: Carderock, 8/IX/70. PRINCE GEORGES CO.: Andrews Air Force Base, 26/V/76; Beltsville, 12/V/68; College Park, 1/VIII/70, 7/V/13, 9/VII/76, 21/VII/43; Seabrook, 8/VII/78. SOMERSET CO.: Deale Island, 4/VIII/62. WASHINGTON CO.: Hancock, 20/VII/78; no locality, 13/VIII/71.

Silpha inaequalis Fabricius

Description: Oblong-ovate, depressed; black, not shining. Pronotum twice as wide as long. Elytra rounded at apex. Length 10-14 mm.

Ecology: This species may be found year round in carrion. Cole (1942) found this species more numerous on carrion in exposed locations. Shubeck (1971) found this to be a diurnal species.

Range: Eastern United States to the Rocky Mountains.

Specimens examined: ALLEGANY CO.: Green Ridge State Forest, 28/VI/80. BALTIMORE CO.: Edgemere, 14/VI/63; Reisterstown, 4/VI/74; Sparks, 2/VI/70. CHARLES CO.: Hilltop, 1/IV/82. DORCHESTER CO.: Preston, 23/III/78. PRINCE GEORGES CO.: College Park, 16/III/44, 2/IV/70, 15/IV/46, 20/IV/34, 23/IV/12, 1/V/40.

Silpha lapponica Herbst

Description: Broadly oblong-ovate; black. Pronotum densely covered with yellowish pubescence, but is sometimes entirely bare. Elytra with four costae. Length 9-13 mm.

Ecology: This species is found primarily on cold-blooded carrion. Anderson (1982a) found this species only in exposed situations.

Range: Arctic Europe and Asia; Alaska and Greenland to District of Columbia, Pennsylvania, Michigan, Iowa, New Mexico, California & Mexico.

Specimens examined: None. This species is primarily northern and western in distribution but has been found in the District of Columbia.

Silpha noveboracensis Forster

Description: Oblong-ovate, depressed. Pronotum piceous, with a wide reddish-yellow margin. Elytra brownish to piceous. Pronotum one-half as wide as long. Length 13-14 mm.

Ecology: This species is usually found on carrion but occasionally can be taken on fungi. Cole (1942) found this species more numerous in wooded areas. Anderson (1982a) found that this was the first species active in the spring and was found in all habitats sampled. Shubeck, et. al. (1981) found this species to be bivoltine in New Jersey. Shubeck (1971) found this to be a diurnal species.

Range: United States east of the Rocky Mountains.

Specimens examined: ALLEGANY CO.: Green Ridge State Forest, 28/VI/80. ANNE ARUNDEL CO.: Friendship, 7/VI/76. BALTIMORE CITY: Leakin Park, 3/VI/76. BALTIMORE CO.: Cockeysville, 2/V/66; Edgemere, 14/VI/63. CHARLES CO.: Hilltop, 1/IV/82. DORCHESTER CO.: Preston, 23/III/78. FREDERICK CO.: Frederick, 13/VI/74; South Mountain, 31/III/16. GARRETT CO.: Backbone Mountain, 16/V/65. PRINCE GEORGES CO.: Beltsville, 1/VII/70; College Park, 30/III/1898, 2/IV/70, 4/IV/18, 9/IV/34, 23/IV/12, 17/VII/16. QUEEN ANNES CO.: Wye Island, 6/V/81. SOMERSET CO.: Shelltown, 27/VI/81.

Blitophaga

Blitophaga opaca (L.)

Description: Oblong-oval, blackish, opaque, clothed with yellowish, orangeish to reddish pubescence. Pronotum twice as wide as long, slightly narrowed in front. Length 11 mm.

Ecology: This species feeds on the roots of beets (Beta spp.) and may be transported with plant shipments.

Range: Europe, New Jersey, California and Canada.

Specimens examined: None. This species may occur in Maryland.

Necrophilus

Necrophilus pettitii Horn

Description: Broadly oval. Flattened; shining brown or reddish brown. Pronotum broad. Elytra non-truncate, covering abdomen, with nine deeply punctate striae. Length 10 mm.

Ecology: This species has been collected in forested habitats mostly in the higher elevations of the southern Appalachians in the summer. It is usually taken on decaying material (dung, carrion, or pit traps). The species is probably nocturnal due to the lack of records for hand collecting and the number recorded in cave entrances. The beetle is flightless (Peck, 1981).

Range: Alabama, Georgia, Illinois, Indiana, Kentucky, Michigan, New York, North Carolina, Ohio, South Carolina, Tennessee, and Virginia.

Specimens examined: None. This species probably occurs in the western Maryland counties.

Nicrophorus

(modified from Arnett, 1944)

1. Pronotum oboval, without distinct sculpturing and very narrowly margined.....carolinus
   Pronotum orbicular, transverse or cordate with distinct sculpturing and widely margined on the sides and back.....2
2. Pronotum orbicular, widely margined at the sides and the base.....orbicollis
   Pronotum not orbicular.....3
3. Pronotum sinuate at sides, base nearly as wide as the apex, sides and base widely margined, not cordate.....4
   Pronotum with base much narrower than apex, sides strongly sinuate, cordate.....8
4. Metasternal epimeron tomentose.....5
   Metasternal epimeron glabrous.....6
5. Pronotum disc orange, margin black; front orange.....americanus

Pronotum black; front black.....savi
6. Three terminal segments of antennae black.....vespilloides
Three terminal segments of antennae orange.....7
7. Elytral margin not attaining humerus; elytra immaculate, without longitudinal raised lines.....investigator
Elytral margin much longer; elytra with distinct raised longitudinal lines.....pustulatus
8. Thorax tomentose.....9
Thorax glabrous.....marginatus
9. Thorax entirely tomentose.....tomentosus
Thorax tomentose apically only.....vespillo

Nicrophorus americanus Olivier

Description: Elongate, robust; black, shining; vertex, disc of pronotum, epipleural fold, frons, and two large, irregular spots on each elytron orange-red. Length 27-35 mm.

Ecology: This species is often found at lights and on larger carrion. Anderson (1982b) feels the decreasing abundance of this species is due to the destruction of primary forests, which are the prime habitat.

Range: United States east of the Rocky Mountains. Anderson (1982b) indicates collections since 1950 in Arkansas, Illinois, Michigan, Missouri, Ontario (Canada) and Tennessee.

Specimens examined: Eight specimens with Maryland state label only.

Nicrophorus carolinus (L.)

Description: Moderately elongate; head and thorax in repose rather strongly deflexed. Pronotum oval, as long as wide. Elytra black with a small subhumeral spot, a subbasal fascia, a humeral spot and a reniform spot. Length 20-28 mm.

Ecology: Arnett (1946) reported this species burying a dead snake.

Range: Gulf states west to Arizona north to Kansas, Nebraska and Pennsylvania.

Specimens examined: FREDERICK CO.: Ijamsville, 18/V/1898. PRINCE GEORGES CO.: College Park, 20/VI/41; Greenbelt, 8/V/61.

Nicrophorus investigator Zetterstedt

Description: Pronotum quadrilateral. Elytra with margin not attaining humerus. Three terminal segments of antennae orange. Tip of pygidium with yellow pubescence. Length 10-20 mm. This is a highly variable species.

Ecology: Reported from carrion.

Range: Europe, Northern Asia, Alaska and Manitoba to Colorado, New Mexico, Arizona, Utah, and Oregon. This species is included because of a questionable report from Virginia.

Specimens examined: None.

Nicrophorus marginatus Fabricius

Description: Elongate, robust; black, shining. Elytra with two irregular orange crossbars which are connected on side margin. Pronotum narrower behind middle. Length 20-27 mm.

Ecology: This species is found primarily on cold-blooded carrion in open habitats.

Range: Entire United States and Canada.

Specimens examined: MONTGOMERY CO.: Seneca, 26/X/75. PRINCE GEORGES CO.: Beltsville, 1/VII/70; College Park, 22/VII/16.

Nicrophorus orbicollis Say

Description: Elongate, robust; piceous or black, shining. Elytra with transverse fascia at basal third and a yellow or red preapical macula. Antennal club and sometimes protarsi reddish brown. Meso- and metatibiae straight. Length 20-25 mm.

Ecology: Shubeck (1976) found this species more commonly on cold-blooded carrion. Anderson (1982a) found this species more commonly in forested areas. Shubeck (1971) found this to be a nocturnal species. This species is attracted to light.

Range: Eastern United States.

Specimens examined: ANNE ARUNDEL CO.: Edgewater, 11/VII/80, 2-4/V/83, 19-26/V/83, 13-16/VII/83. BALTIMORE CO.: Cockeysville, 1/VII/70;

Hawkins Point, V/62; Hebbville, 10/V/70. FREDERICK CO.: Frederick, 20/VI/74, 11/VII/74. KENT CO.: Chesterville, 15/V/78. MONTGOMERY CO.: Laytonsville, 15/V/78; Seneca, 26/X/75. PRINCE GEORGES CO.: College Park, 21/XI/70; no locality, 14/VII/76.

Nicrophorus pustulatus Herschel

Description: Moderately robust, piceous to black, elytral markings variable. Antennae piceous; club red with first segment black. Pronotum transversely oval, sides slightly sinuate at middle. Elytra nearly as wide as base of pronotum, with two indistinct costae. Length 20-25 mm.

Ecology: Shubeck and Blank (1982) record this species from dead fetal pig. Anderson (1982a) found this species in forested areas. This species is attracted to light.

Range: Minnesota to Newfoundland south to Colorado, Texas and Florida; also reported from California.

Specimens examined: PRINCE GEORGES CO.: Calverton, 10/VII/76; Upper Marlboro, 30/III/79, 19/VI/79. ANNE ARUNDEL CO.: Edgewater, 13-16/VII/83, 29/IV/83, 24-28/IV/83, 9-11/VII/83.

Nicrophorus savi Laporte

Description: Elongate, robust; black, shining. An orange-red crossbar and subapical spot on each elytron. Antennal club and often protarsi reddish brown. Length 16-18 mm.

Ecology: Anderson (1982a) found this species more commonly in forested areas.

Range: Northeastern United States.

Specimens examined: None.

Nicrophorus tomentosus Weber

Description: Elongate, robust; black, shining. Two orange-red crossbars on elytra. Pronotum broader than long, clothed with silky yellow hairs. Length 15-20 mm.

Ecology: This species is found on carrion of all types. Anderson (1982a) found this species active in all habitats sampled. Shubeck (1971) found this to be a diurnal species.

Range: United States east of the Rocky Mountains.

Specimens examined: ANNE ARUNDEL CO.: Friendship, 1/VI/76. BALTIMORE CITY: 1/IX/73. BALTIMORE CO.: Cockeysville, 26/IX/75; Hebbville, 2/VI/74. FREDERICK CO.: Frederick, 11/VII/74; Gambrills State Park, 6/VIII/61.

Nicrophorus vespillo L.

Description: Pronotum pubescent apically only. Posterior tibiae curved. First segment of antennal club black.

Ecology: Unknown.

Range: Nebraska and Pennsylvania.

Specimens examined: None.

Nicrophorus vespilloides Herbst

Description: Antennae entirely black. Pronotum quadrilateral, visibly broader in front. Elytra black with two orange-red fasciae. Length 9-16 mm.

Ecology: Carrion. Anderson (1982a) found this species only in marshy areas.

Range: Alaska and Newfoundland to central California, Montana, Minnesota, Wisconsin, Michigan, and New Jersey.

Specimens examined: GARRETT CO.: Backbone Mountain, 7/VIII/69.

Acknowledgements

I would like to thank F.E. Wood (University of Maryland) and E.J. Ford for allowing me to examine the collections under their care.

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RECENT OBSERVATIONS ON NORTH AMERICAN ADMIRALS (LEPIDOPTERA:NYMPHALIDAE)

Austin P. Platt

The following observations are based on several papers presented at scientific meetings by me during 1985. These papers were given at the following meetings (listed chronologically):

1. The Annual Meeting of the Entomological Society of Pennsylvania, Carlisle, PA, March 28-29, 1985 (held in conjunction with M.E.S.);
2. The Annual Meeting of the Society for the Study of Evolution, Chicago, IL, June 23-26, 1985; and
3. The Annual Meeting of the Lepidopterist's Society, University of Illinois, Urbana, IL, July 18-21, 1985. (Two papers, one invited, one contributed).

Additional information, relating to hybrid form "Rubidus" Stkr. was written to accompany specimens of this form. These observations summarize recent findings obtained from my ongoing studies of this fascinating group of butterflies.

Selective forces and phenotypic divergence among admiral butterflies (Limenitis)

North American admirals represent a monophyletic assemblage of five common and wide-spread butterflies evidencing differing degrees of speciation. Four allopatric forms (arthemis (Drury), astyanax (Fabr.), weidemeyerii (Edw.), and lorquini (Bdv.)) constitute a "super-species" (Mayr, 1963). Three of these represent separate species which preserve the ancestral disruptive medial white band wing pattern characterizing most species of the tribe Limenitini. Only astyanax, widely held to be a Batesian mimic of the unpalatable troidine swallowtail Battus philenor L., has not achieved species status. Instead, wherever arthemis and astyanax occur together they form inter-fertile blending (and phenotypically variable) populations which are held in Hardy-Weinberg equilibrium by the counter-balancing selective forces of disruptive coloration and mimicry. This "super-species" can be sub-divided into a western (Montane) complex, consisting of weidemeyerii and lorquini, two species separated by the Continental Divide (except at certain mountain passes), and an eastern (woodlands) complex, made up of the arthemis-astyanax butterflies. "Free interbreeding" and gene exchange occur between the northern banded and southern unbanded forms of this complex, which are interconnected by a series of blending populations containing numerous phenotypically variable partially banded heterozygotes (form "proserpina" Edw.). Some of the latter possess the merest trace of white banding along the outer

medial region of the ventral forewings only. Thus, they closely resemble astyanax. Results of field sampling and laboratory breeding of these insects supports the contention that this is a single species complex, resulting from primary intergradation of the two distinctive (mainly allopatric) parent morphs.

Super-imposed on the distributions of these four insects is that of the broadly sympatric mimetic species, L. archippus (Cr.). This butterfly mimics various danaid models in different geographic areas, having undergone racial divergence in the southern and southwestern portions of its range. Archippus evidences various degrees of pre-mating and post-mating isolation from its congeners, including nearly complete heterogametic (female) inviability in crosses involving the other species. Phenotypic divergence among these insects seems to be independent of gene flow.

Interspecific hybridization involving Maryland strains of Limenitis

Ten reciprocal interspecific crosses between Maryland strains of L. arthemis astyanax and L. archippus were carried out by hand-pairing during 1983-1984. All larvae were reared on long-day (18L:6D) photoperiod using either Salix babylonica L. (Cross Type I - F_1's of female archippus) or Prunus serotina Ehrh. (Cross Type II - F_1's of female astyanax) as foodplants. The respective strains differed geographically, with each mating involving a wild-caught male. A total of 313 F_1 progeny (hybrid form "rubidus" Strk.) were reared. Included among these offspring is the first heterotic F_1 female of this form. Three other weak F_1 females also eclosed. The reciprocal crosses differ in relative viability and survival. Species compatability may be inversely related to geographic distance between the respective parental strains, but environmental variables (foodplant, season, etc.) were not properly controlled.

A third type of cross (one brood) involved a "trace banded" (phenotypic category 5) female astyanax x male archippus. Both P_1's had been wild-collected in hibernacula on Salix fragilis L. from the same locality in Frederick Co. This cross yielded 16 male offspring, with hybrid form "arthechippus" Scudder and hyb. "rubidus" Strk. in a 1:1 ratio. Hybrid "rubidus" males were successfully backcrossed to parental females in three cases. One such brood (archippus female x Hyb. "rubidus" male) yielded four major phenotypes (dark vs. light; partially banded vs. unbanded) in equal numbers. All six bred backcross females were infertile. The occurrence of all male natural hybrids between L. archippus and its congeners was reviewed by Platt, et al (1978). The known number of such wild hybrids presently totals 58.

Interspecific hybrid "rubidus" Strecker

This butterfly is a rare true interspecific hybrid between Limenitis arthemis astyanax and Limenitis archippus. These two butterflies are classic Batesian mimics of Battus philenor L. and Danaus plexippus L., respectively. The two species of Limenitis have been cross-bred in the laboratory by hand-pairing. Only a total of 32 specimens are known by me to have been collected in the wild. All are males, because heterogametic inviability occurs in this cross, resulting in the loss of the hybrid females. Most "rubidus" records occur late in the season (August-November), the mean collecting date for 21 specimens being September 5th.

The hybrid form was described by Herman Strecker (1878) based on a Type specimen from Berks County, Pennsylvania, now in the collection of the Allyn Museum, Sarasota, Florida. Strecker's name relied on an earlier description of this hybrid butterfly given by T.L. Mead (1872). In recent years a number of additional specimens have been taken, usually with only one or two occurring in any one locality. Its known geographic range extends from Massachusetts to Florida along the Atlantic seaboard westward to Nebraska, Texas, and southern New Mexico.

The insect is intermediate in morphology, genitalic structure, and behavior between the two mimetic parental species. As such it undoubtedly is at a selective disadvantage in the wild, and it illustrates well the breakdown of Batesian Mimicry in Nature. Hybrid larvae will feed on either black cherry (Prunus serotina Ehrh.) or willows (Salix spp.), the preferred foodplants of the two parental species. Some hybrid males are fertile in laboratory backcrosses to the parental species. The occurrence of these hybrids attests to the close evolutionary affinities of L. arthemis astyanax and L. archippus.

To my knowledge, hybrid "rubidus" has not yet been collected wild in Maryland. However, Platt (1983) reports (and illustrates in color) a specimen collected by P.A. Opler from Huntley Meadows (Fairfax Co.), VA, 15 July 1979. An early record is from Washington, D.C. (Newcomb, 1907),

and, recently, an old specimen was brought to me by Mr. L. Darr of Middletown, Maryland. This was purported to have been collected near Dover, DE (Kent Co.) in late September, 1943. Such hybrids should be sought late in the collecting season, in areas where the two parent species occur together. Hybrids are most likely to be encountered when one or both species are scarce.

Acknowledgements

Phil Kean kindly provided wild-collected hibernacula from which the lab strains used in my rearing studies were established. Over the years, he has provided me with many live wild-collected females of L. archippus and L. arthemis astyanax which have served as original parents for my laboratory cultures of these butterflies.

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OBSERVATIONS OF EARLY SPRING ACTIVITY OF LEAF BEETLES (COLEOPTERA:CHRYSOMELIDAE) IN MARYLAND

J. F. Cavey

Most leaf beetles, with known life cycles, overwinter as adults. In central Maryland, anxious collectors can expect to sweep or observe their first active beetles in late March to early April. Yet, with the lucrative season just ahead and little host foliage present, most seem to postpone their efforts. Indeed, from the collections of Mr. E.J. Ford and myself, together comprising well over 250 species of Maryland Chrysomelidae, specimens of only 15 species were collected before May. To satisfy my curiosity, this study was designed to monitor chrysomelid activity in the early spring, and more specifically, to document the sequential emergence of different species in central Maryland.

A known productive leaf beetle collecting site was chosen for the survey to assure adequate species diversity. Located near BWI Airport in Anne Arundel County, Md., the site consists of approximately 1½ acres of marsh, swamp, and forest. The variety of microhabitats provides many host species including woody pines (Pinus spp.), willows (Salix spp.), maple (Acer spp.), oaks (Quercus spp.), river birch (Betula nigra L.), buttonbush (Cephalanthus occidentalis L.), wild cherry (Prunus spp.), smooth alder (Alnus serrulata Ait.), spicebush (Lindera benzoin L.), elderberry (Sambucus canadensis L.), arrow wood (Viburnum dentatum L.), hazelnut (Corylus spp.), dogwood (Cornus stolonifera Michx.), and numerous herbaceous annuals and perennials.

Beginning on 29 March 1985 (the second day of recent high temperatures above 80°F), the site was thoroughly swept with a 15" diameter net for 25 to 35 minutes between 12:00 and 1:00 PM each survey day when the temperature exceeded 49°F and weather permitted. The net bag contents were emptied once or twice into a plastic "zip-lock" bag to which a few ml. of ethyl acetate were added for a complete kill. The samples were meticulously screened in the laboratory in well lit conditions and under the microscope when necessary to extract even the smallest beetles. All chrysomelid sample specimens were identified, counted, and listed for each sample day. Some measures were taken to overcome the difficulty in maintaining uniformity in sampling during the survey. Primarily this involved walking the same path through the survey site each sample day,

Table 1. Results of 1985 chrysomelid early spring activity survey: flea beetle species (subfamily Alticinae)

Species	Number of specimens per collection date										
	3/29	4/1	4/4	4/5	4/8	4/11	4/12	4/16	4/17	4/18	4/26
Phyllotreta cruciferae (Goeze)	2		4	4	2	1	1	42	12	5	2
Phyllotreta striolata (Fabr.)	2	5		3	1	1		1		2	1
Longitarsus spp.	1	3				1		1			1
Chaetocnema pulicaria Melsh.		2		10		1	5	20	5	7	17
Chaetocnema minuta Melsh.		6	1	2	1	1		1	2	2	1
Chaetocnema protensa LeConte			1	1		2		4	1	4	21
Chaetocnema confinis Crotch											4
Hornaltica atriventris Melsh.				1				1			
Disonycha procera Casey								1			
Disonycha collata (Fabr.)									1		
Crepidodera nana (Say)										1	22
Strabala rufa (Illiger)										1	
Kuschelina spp., "miniata complex"											1

while continually sweeping for the entire 30 minutes. Also, the survey was conducted during the same hour each day. Initially, little host foliage was growing and sweeping was confined mostly to the previous seasons' growth. As the early season progressed, especially as a result of deciduous foliage emergence, sweeping patterns were modified to include fresh host material.

The survey was conducted from 29 March to 26 April 1985. The record dry spring allowed for frequent sampling amounting to 11 days* in the first three weeks of the test period. One final sample was taken eight days later on 26 April. By this time, large numbers of specimens of common species and the resultant increase in sample processing time helped dictate the conclusion of the survey. However, for comparative purposes, I maintained a list of chrysomelid species collected in the following six weeks at the same site, but not encountered during the survey (Table 3).

Tables 1 and 2 illustrate the results of the 29 day sample period during which 12 surveys were conducted. A total of 30 species of Chrysomelidae were collected.

The first survey week (29 March to 4 April) offered little fresh host material to sweep. Though willows were blooming, no deciduous foliage had emerged. New growth was evident on low growing winter cress (Barbarea vulgaris R. Br.), grasses, and sedges in the open marsh. For the most part, sweeping motions were kept close to the ground (or water) to dig out specimens on the low, new foliage. Taller remnants of 1984 asters, goldenrods (Solidago spp.), rattlebox (Crotolaria spp.), sedges, etc. were beaten especially on cool, sunny days to net active adults expected to climb the old vegetation to sun themselves. Only eight chrysomelid species were collected during the first survey week. Consistent with past experience, most (ie. 6 of 8) were flea beetles (subfamily Alticinae).

During the second survey week (5 to 11 April) willow leaves opened, winter cress bloomed, and panic grasses (Panicum spp.), day lillies (Hemerocallis fulva), goldenrods, and clover (Trifolium spp.) became apparent, though growth was slow. Despite cool weather most of the week and frost one night, six species not previously encountered were netted on 5 April, the one warm day. Still flea beetles outnumbered all other

* Ed. note - A column for 4/15, in Table 1, has been omitted because of space limitations. There were no alticines recorded for that day.

Table 2. Results of 1985 chrysomelid early spring activity survey: non-alticine species

Species	Number of specimens per collection date									
	3/29	4/1	4/4	4/5	4/8	4/11	4/12	4/16	4/17	4/18	4/26
Oulema melanopus (L.)	1	1	1				2				
Donacia biimpressa Melsh.		1	2		1		1	3		12	60
Plateumaris sulcicollis (Lac.)							1	1	2	1	7
Exema canadensis Pierce				1					1	1	1
Neochlamisus spp.				1					1		7
Paria fragariae Wilcox				1						2	
Paria scutellaris (Not.)							1				
Hydrothassa vittata (Olivier)				1				4	3	2	
Microrhopala xerene (Newman)				1						1	1
Plagiodera versicolor Laich.								4	4	3	7
Calligrapha bidenticola Brown								1			1
Myochrous denticollis (Say)								1			
Ophraella notata (Fabr.)								1	1	5	7
Ophraella cribrata (LeConte)											1
Acalymma vittata (Fabr.)											1
Sumitrosis inaequalis (Weber)											3
Stenispa metallica (Fabr.)											6

chrysomelid species seven to six.

The spring season became truly evident in the third week (12 to 18 April). Spring beauties (Claytonia virginica), violets (Viola spp.), trout lilies (Erythronium americanum), and marsh buttercups (Ranunculus septentrionalis) bloomed on the forest floor while deciduous tree leaves opened above. In the open marsh and fields, panic grass bloomed and goldenrods, dock (Rumex spp.), cattails (Typha latifolia L.), blackberries (Rubus spp.), day lilies and many others proliferated as midday temperatures averaged 65°F. Eleven more chrysomelid species were added to the list. No longer in the majority, flea beetles comprised 11 of 24 leaf beetle species.

Only one survey was conducted after the third week, eight days later (26 April). Six more species were added.

Collecting and observations at the same site continued for six weeks after the survey. Species recognized or suspected as different from those collected during the survey were kept, identified, and listed in Table 3. During the six week period, half of the additional 22 species collected were flea beetles. Of the total 52 chrysomelid species collected at the survey site from 29 March to 7 June 1985, 24 (ie. 46%) were flea beetles. Though still abundant later in the season, the number of flea beetle species and individuals was proportionately highest in late March and early April.

One must exercise caution when drawing conclusions from such a survey. Of prime concern is the qualitative rather than quantitative nature of the study, ie. not all species active on a given date will be collected. Uncommon species might evade the net for days or weeks after they

Ed. note - The column for 4/15, in Table 2, has also been omitted because of space limitations. There was a single specimen of Donacia biimpressa recorded for that day.

Table 3. Leaf beetle species collected after 1985 early spring activity survey at same site

chrysomelid species	collection date
Chalepus bicolor (Olivier)	4/30/85
Odontota scapularis (Olivier)	"
Chaetocnema denticulata* (Illiger)	"
Phyllotreta liebecki* Schaeffer	"
Donacia aequalis Say	5/01/85
Donacia subtilis Kunze	"
Calligrapha philadelphica (L.)	"
Baliosus ruber (Weber)	5/13/85
Capraita sexmaculata* (Illiger)	"
Paria spp.	"
Altica spp. (1)*	5/20/85
Epitrix fuscula* Crotch	5/21/85
Mantura floridana* Crotch	5/22/85
Disonycha glabrata* (Fabr.)	"
Altica spp. (2)*	"
Ophraella sexvittata (LeConte)	5/24/85
Epitrix cucumeris* (Harris)	6/04/85
Exema spp., prob. neglecta Blatchley	"
Psylloides napi* (Fabr.)	"
Systena blanda* Melsheimer	"
Exema byersi Karren	6/07/85
Sumitrosis rosea (Weber)	"

* - species of flea beetle (subfamily Alticinae)

first become active, for example. Consequently, without similar data from other localities, habitats, years, etc., detailed evaluation of these results is difficult and ill advised. Still, a few observations appear noteworthy.

Before 1985 in the combined collections of Mr. E.J. Ford and the author, nine of 15 chrysomelid species with collection dates prior to May were flea beetles (subfamily Alticinae). In the first two weeks of this survey, the number of alticines exceeded all other leaf beetle species and specimens on every sample day. At least two factors may be responsible.

The survey provides some evidence that some flea beetles may exhibit exceptional species tolerance to low temperatures. Daily high temperatures averaged a cool 55°F from 8 April to 11 April during the second survey week. An early morning frost on 10 April represented the only freezing temperature during the survey. On the first sample day after the frost (11 April) only flea beetles (6 species) were collected. Seven non alticine species netted prior to 11 April were not seen.

The availability of host material also seems to be a factor contributing to the early activity of certain chrysomelids. In the first survey week, the appearance of nearly all captured chrysomelid species coincided with early growth of their host plants: Phyllotreta spp. on brassicas (eg. winter cress), Chaetocnema spp. and Oulema melanopus (L.) on grasses, and Donacia biimpressa Melsheimer on sedges (Wilcox, 1979). These host groups were virtually the only plants with obvious new foliage at the time.

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ADDENDA TO THE CHECKLIST OF MARYLAND SCARABAEOIDEA

John D. Glaser

The following additions, corrections, substantiating records, and supplementary data for a few rare species, are offered to update the Checklist of Maryland Scarabaeoidea (Staines, 1984). All specimens cited

are in the collection of the author.

Aphodiinae

Aphodius campestris Blatchley. Anne Arundel, Calvert, Dorchester. May through July. Taken in malt traps in sandy areas.
A. silvanus Cartwright. Calvert. March and November. Deer dung.
A. manitobensis Brown. Garrett. September. Blacklight trap.
A. phaleroides Horn. Worcester. July.
A. robinsoni Cartwright. Allegany. October. Deer dung.
Ataenius punctifrons Cartwright. Anne Arundel, Queen Annes. April. Under beach drift.
Rhyssemus scaber Haldeman. Worcester. August. Under beach drift.

Scarabaeinae

Ateuchus lecontei (Harold). Anne Arundel, Dorchester, Worcester. May through August. Taken in malt traps in sandy areas.
Onthophagus oklahomensis Brown. Anne Arundel. July. Taken in malt traps in sandy areas.
O. taurus Schreber. Allegany, Charles. May through August. A rapidly-spreading introduced species.

Geotrupinae

Bolboceras simi (Wallis). Worcester. April. At light.
B. thoracicornis (Wallis). Baltimore. September. Burrowing in forest road.

Ochodaeinae

Ochodaeus musculus Say. Baltimore. August. Burrowing in forest road.

Melolonthinae

Phyllophaga vilifrons (LeConte). Allegany, Anne Arundel, Baltimore, Charles. April through May.
P. glaberrima Blanchard. Worcester. July.
P. debilis (LeConte). Prince Georges. June.
P. georgiana (Horn). Dorchester, Wicomico. August.
P. longispina (Sm.). Garrett. June.
P. paternoi Glasgow. Calvert, Charles, Prince Georges, St. Marys. March through June.
P. profunda (Blanchard). Calvert. July.
P. postrema (Horn). Worcester. June.
Diplotaxis subcostata Blanchard. Anne Arundel, Caroline, Dorchester. May.
D. bidentata LeConte. Worcester. June.
D. blanchardi Vaurie. Charles. August.
Dichelonyx diluta Fall. Allegany, Garrett. June.
Serica opposita Dawson. Anne Arundel, Calvert, Caroline, Prince Georges, Worcester. April through June.
S. carolina Dawson. Worcester. May to June.
S. elusa Dawson. Allegany, Garrett. May through July.
S. sponsa Dawson. Allegany. May.

Troginae

Trox aequalis Say. Anne Arundel, Charles, Prince Georges, Worcester. April through June.
T. scabrosus Beauv. Prince Georges. July.

Dynastinae

Dyscinetus trachypygus (Burm.) = D. morator (Fabr.). Listed separately by Staines.

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The Maryland Entomologist is published irregularly by the Maryland Entomological Society. There are four numbers in each volume. Original articles on geographic and temporal distribution, particularly pertaining to Maryland and adjacent states, ecology, biology, morphology, genetics, systematics, behavior, etc. are welcome. Book notices and reviews, news of the members, requests for information, notes on distribution, occurrence, migration, life history and others will be published. All articles are subject to editorial review and acceptance. They should be sent to C.L. Staines, Jr., 3302 Decker Place, Edgewater, Md. 21037.

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Contributors should prepare manuscripts according to the following instructions.

Text: Manuscripts should be submitted in duplicate, and must be typewritten, entirely double-spaced, employing wide margins on all sides (not less than 3/4 of an inch for pica type nor less than 1¼ inches for elite type), on one side only of 8½ X 11 inch paper. The first mention of a plant or animal in the text should include the full scientific name, with authors of zoological names. Carefully check the spelling of all zoological names. Underline only where italics are intended. Short articles and general notes are preferred, up to a maximum of 20 pages. Longer manuscripts, if accepted, may be assessed page charges.

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Tables: Tables, graphs and line drawings should be done with indelible, black ink and should be placed on separate sheets, following the main text, with the approximate desired position indicated in the text.

Illustrations: Photographs may be accepted if they are necessary to support the text. Reproduction of photographs may increase the printing cost and authors should expect to pay any extra charges. Photographs should be approximately 2½ X 3½ inches, if depicting single specimens, and not larger than 5 X 7 inches for groups of specimens. They must be black and white, glossy finish and mounted with frosted tape, wax, or rubber cement to an extra sheet of paper. Figure numbers, as cited in the text, and figure legends should be typewritten below each photograph.

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